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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,562	12/30/2003	Gregory P. Crawford	59067US002	8039

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EXAMINER	
CHEN, WEN YING PATTY	
ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 06/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/748,562	CRAWFORD ET AL.	
	Examiner	Art Unit	
	Wen-Ying P. Chen	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-53 is/are pending in the application.

4a) Of the above claim(s) 3,6-9,27-40 and 42-53 is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,2,4,5,10-26,31,34,38,41 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I, specie (1), sub-specie (a), sub-sub-specie (i) in the reply filed on 5/27/05 is acknowledged.

Applicants submit that at least claims 11-24 are generic, thus requested for examination together with the elected sub-sub-species. The examiner believes that claims 4, 5, 10, 25, 26, 31, 34, 38, and 41 are also generic; therefore, claims 1, 2, 4, 5, 10-26, 31, 34, 38, and 41 are examined. Hence, claims 3, 6-9, 27-40, and 42-53 are withdrawn from consideration.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4-5, 11, 18-19, and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Reznikov et al. (US 6433850).

With respect to claims 1-2 and 4-5: Reznikov et al. disclose in Figure 2 and Column 2, lines 56-65 a method comprising: exposing a surface of an alignment material (element 15) to an interference pattern (pattern formed by first light source, element 11, irradiating from a first direction, and by a second light source, element 18, from another direction) to cause a photo polymerization in the alignment material (Column 1, lines 10-13); and exposing the alignment material to a liquid crystal, wherein the liquid crystal aligns relative to the alignment material based on the interference pattern (Abstract).

As to claim 11: Reznikov et al. disclose in Figure 2 that the alignment material (element 15) is disposed on a surface of a substrate (element 16) comprising a substrate material.

As to claims 18 and 19: Reznikov et al. disclose in Column 3, lines 2-4 that the alignment material comprises a polymer of a cinnamate group.

As to claim 38: Reznikov et al. disclose in Figure 2 an interference pattern formed by overlapping two beams (beams generated by elements 11 and 18).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 10, 12-15, and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reznikov et al. (US 6433850) in view of Yamada et al. (US 6067141).

With respect to claim 10: Reznikov et al. disclose all of the limitations set forth in the previous claims, but fail to disclose that the surface of the alignment material comprises a channel. However, Yamada et al. disclose in Figure 3A an alignment layer (element 52), which comprises a channel.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an alignment layer comprising of a channel as taught by Yamada et al. when patterning the alignment layer using the method as taught by Reznikov et al. since Yamada et al. teach that the channels form multiple domains in the display region, wherein the liquid crystals can thus have randomized alignment directions and thus provide a liquid crystal

display device which has an excellent all-direction viewing angle characteristic (Column 13, lines 53-59, Column 9, lines 4-7).

As to claims 12-15 and 20: Reznikov et al. disclose all of the limitations set forth in the previous claims, but fail to specifically disclose the substrate configuration. However, Yamada et al. disclose that the alignment layer made of polyimide (Column 10, line 19) is formed on a glass substrate (Column 10, line 24), wherein the substrate comprises a transparent electrode layer (Column 10, lines 25-26) and a thin film transistor (Column 12, lines 15-20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form an alignment layer for orienting the liquid crystal using the method taught by Reznikov et al. on an array substrate configured according to Yamada et al. so that an active matrix display type can be obtained, as taught by Yamada et al. (Column 16, lines 62-66).

As to claim 21: Reznikov et al. disclose all of the limitations set forth in the previous claims, but fail to disclose that the alignment material comprises of silane. However, Yamada et al. teach the use of silane on the alignment layer (Column 12, lines 7-14). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use silane on the alignment layer as taught by Yamada et al. and pattern the alignment layer with the method taught by Reznikov et al. since Yamada et al. teach that silane treatment of the alignment layer helps in fixating the alignment layer on the substrate (Column 12, lines 7-14).

Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reznikov et al. (US 6433850) in view of Margerum et al (US 5096282).

Reznikov et al. disclose all of the limitations set forth in the previous claims, but fail to disclose that the alignment material comprises a liquid crystal and that the liquid crystal permeates the alignment material. However, Margerum et al. teach the use of a polymer dispersed liquid crystal device, wherein the alignment material contains liquid crystal filled bubbles (Abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to pattern an alignment material as taught by Reznikov et al., wherein the alignment material comprises of liquid crystal as taught by Margerum et al., since Margerum et al. teach that the polymer dispersed liquid crystal material provides better light scattering properties over a broad range of wavelengths (Column 6, lines 21-23).

Claims 22-23 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reznikov et al. (US 6433850) in view of Kelsey et al. (US 2002/0169849).

Reznikov et al. disclose all of the limitations set forth in the previous claims and further disclose the use of UV radiation in forming the pattern (Column 2, line 56), but did not disclose that two or more beams, which generate from the same source, are used in forming the interference pattern. However, Kelsey et al. disclose in Figure 6b the use of three laser light beams having at least two beams with similar polarization states, generated from the same laser source in forming the interference pattern.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to pattern the alignment material as taught by Reznikov et al. using the light beam source configuration as taught by Kelsey et al. since the overlapping regions of the

different light beams generate specific periodic structures on the surfaces, as taught by Kelsey et al. (Paragraph 0054).

Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reznikov et al. (US 6433850) in view of Hirata et al. (US 5652634).

With respect to claim 24: Reznikov et al. disclose all of the limitation set forth in claim 1, but fail to disclose that the interference pattern is formed from electron beams. However, Hirata et al. teach the use of electron beams when patterning an alignment layer (Column 25, lines 30-32). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to pattern the alignment material as taught by Reznikov et al. using the electron beams as taught by Hirata et al. since Hirata et al. teach that electron beams are used to easily obtain high energy sufficient enough to change the orientation direction of the liquid crystal molecules (Column 25, lines 21-36).

As to claims 25 and 26: Reznikov et al. disclose all of the limitation set forth in claim 1, but fail to disclose that the interference pattern comprises regions of different intensity. However, Hirata et al. teaches the patterning of alignment layer, wherein the pattern comprises regions of different intensity and that the liquid crystal aligns based on the intensity of the pattern (Column 16, lines 54-67; Column 17, lines 1-5). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to pattern an alignment material using the method as taught by Reznikov et al. such that various density regions are formed on the alignment material as taught by Hirata et al. since Hirata et al. teach that the different density

regions are formed as to control the pre-tilt angle of the liquid crystal in different regions (Column 17, lines 3-5).

Claims 31 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reznikov et al. (US 6433850) in view of Hattori et al. (US 2002/0067451).

Reznikov et al. disclose all of the limitation set forth in claim 1, but fail to disclose that the interference pattern comprises regions of different polarization. However, Hattori et al. teaches the patterning of alignment layer, wherein the pattern comprises regions of different polarization and that the liquid crystal aligns relative to the polarization of the patterns (Paragraph 0035). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to pattern an alignment material using the method as taught by Reznikov et al. such that various polarization regions are formed on the alignment material as taught by Hattori et al. since Hattori et al. teach that by having different polarization regions a good viewability in various directions can be ensured (Paragraph 0035).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bryan-Brown et al. (US 5796459); as an alternative method of creating interference patterns on the alignment film for aligning liquid crystal.

Lim et al. (US 6184958); as an alternative method of forming interference patterns, which defines multi-domain regions of the liquid crystal.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wen-Ying P. Chen whose telephone number is (571)272-8444. The examiner can normally be reached on 8:00-5:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wen-Ying P Chen
Examiner
Art Unit 2871

wpc

ANDREW SCHECHTER
PRIMARY EXAMINER